

Appl. No. : 10/803,267
Filed : March 18, 2004

REMARKS

The foregoing amendments and the following remarks are responsive to the August 9, 2006 Office Action. Claims 1, 7, 8, 15, and 16 have been amended, and Claims 17-21 are newly added. Thus, Claims 1-21 are pending in the present application.

Applicants respectfully request the Examiner to reconsider the above-captioned application in view of the foregoing amendments and the following comments.

Response to Rejection of Claim 16 Under 35 U.S.C. § 101

In the August 9, 2006 Office Action, the Examiner rejects Claim 16 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. The Examiner states that Claim 16 fails to either result in the transformation of an article or physical object or provide a practical application that produces a useful, concrete, and tangible result. In particular, the Examiner states that “[m]erely analyzing ... would not appear to be sufficient to constitute a tangible result, since the outcome of the analyzing step has not been used in a disclosed practical application nor made available in such a manner that [its] usefulness in a disclosed practical application can be realized.”

Applicants respectfully traverse this argument. Applicants submit that the Examiner has not established a *prima facie* case of ineligible subject matter pursuant to 35 U.S.C. § 101. “The examiner bears the initial burden ... of presenting a *prima facie* case of unpatentability.” *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992). As outlined in the “Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility,” if the record as a whole suggests that it is more likely than not that the claimed invention would be considered a practical application of an abstract idea, natural phenomenon, or law of nature, the Examiner should not reject the claim. Only when the claimed invention is devoid of any limitation to a practical application should it be rejected under 35 U.S.C. § 101. *See*, M.P.E.P. § 2107, p. 2100-7 (Rev. 3, August 2005) (emphasis added). Upon the Examiner identifying and explaining in the record the basis for why a claim is for an abstract idea with no practical application, the burden shifts to Applicants to either amend the claim or make a showing of why the claim is eligible for patent protection. *See, e.g., In re Brana*, 52 F.3d 1560, 1566, 34 U.S.P.Q.2d 1436, 1441 (Fed. Cir. 1995); *see generally* M.P.E.P. § 2107. Applicants submit that the Examiner has not presented a *prima facie* case of unpatentability by explaining

Appl. No. : **10/803,267**
Filed : **March 18, 2004**

why the pending claims of the present application are devoid of any limitations to a practical application.

As explained in the "Interim Guidelines," a claimed invention must accomplish a practical application by producing a "useful, concrete and tangible result." (Citing *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, 149 F.3d 1373-74, 47 U.S.P.Q.2d 1601-02 (Fed. Cir. 1998); see, also, *Ex parte Lundgren*, Appeal No. 2003-2088, B.P.A.I. 2005). Applicants submit that Claim 16 of the present application includes limitations to a practical application by producing a useful, concrete, and tangible result, thereby conforming to the requirements of 35 U.S.C. § 101.

Applicants submit that the claimed invention of Claim 16 provides a useful result that is specific, substantial, and credible in accordance with M.P.E.P. § 2107. In addition, Applicants submit that the claimed invention of Claim 16 produces concrete results that can be substantially repeated to substantially produce the same results again. Applicants also submit that by detecting an embedded object within a laser-irradiated interaction region of a structure, the claimed invention of Claim 16 provides tangible results by setting forth a practical application with real-world results. Therefore, Applicants submit that Claim 16 of the present application satisfies the requirements of 35 U.S.C. § 101 by producing a useful, concrete, and tangible result.

Furthermore, to the extent that the Examiner is asserting that the pending method Claim 16 encompasses statutory subject matter only if it results in a physical transformation or contains a physical limitation, Applicants submit that 35 U.S.C. § 101 does not include such a requirement. This requirement was explicitly addressed in *Application of Foster*, 438 F.2d 1011, 1014 (C.C.P.A. 1971), which held that claims should not be rejected for lack of appropriate subject matter simply because they include steps that transform one mental concept into another. Moreover, in *AT&T Corp. v. Excel Communications Inc.*, 172 F.3d 1352, 1358-59 (Fed. Cir. 1999), the court explicitly held that the assertion that a method claim is patentable only if it results in a physical transformation or contains a physical limitation is incorrect. Additionally, the fact that no physical alteration is required is also supported by the decision of the B.P.A.I. in *Ex parte Lundgren*, which involved claims directed to a method of compensating a manager, where the claims did not recite a required physical alteration.

Appl. No. : 10/803,267
Filed : March 18, 2004

In addition, as the Examiner points out, “[i]n determining whether the claim is for a ‘practical application,’ the focus is not on whether the steps taken to achieve a particular result are useful, tangible, and concrete, but rather that the final result achieved by the claimed invention is ‘useful, tangible, and concrete.’” (Emphasis in original) Thus, the Examiner’s argument that “[m]erely analyzing ... would not appear to be sufficient to constitute a tangible result, since the outcome of the analyzing step has not been used in a disclosed practical application nor made available in such a manner that [its] usefulness in a disclosed practical application can be realized” incorrectly focuses on the steps taken to produce a result – here, analyzing – rather than on the final result achieved, namely, detection of an embedded object within a laser-irradiated interaction region of a structure. Applicant submits that detection of an embedded object is a practical application, and the final result achieved by the analysis step is useful, tangible, and concrete.

For the foregoing reasons, Applicant submits that Claim 16 satisfies the requirements of 35 U.S.C. § 101, and Applicant respectfully requests the Examiner to withdraw the rejection.

All Pending Claims Fully Comply With 35 U.S.C. § 112

Claims 7 and 8 stand rejected under 35 U.S.C. § 112, second paragraph, the Examiner maintaining that the language therein is indefinite. In particular, the Examiner indicates that Claims 7 and 8 lack an antecedent basis for “the focusing lens.”

Applicants submit that amended Claims 7 and 8 fully comply with 35 U.S.C. § 112, second paragraph by providing correct antecedent bases. Applicants further submit that none of the amendments made in response to the rejections under 35 U.S.C. § 112 have narrowed the claim language. Rather, these amendments have been made solely to make the claims more easily readable. Thus, all of the equivalents of the original recitations in these claims are also equivalents of the now recited recitations.

Satoru Does Not Disclose the Detection System and Method Recited By Claims 15 and 16

Claims 15 and 16 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Satoru *et al.* (Japanese Patent No. 2002-296183) (“Satoru”). Applicants respectfully traverse the present rejection.

Appl. No. : 10/803,267
Filed : March 18, 2004

Amended Claim 15 recites (emphasis added):

A detection system for use during irradiation of an interaction region of a structure with laser light, the structure comprising embedded material, the detection system comprising:

means for drilling a hole in the structure, thereby exposing previously-unexposed embedded material within the interaction region;

means for collecting light emitted from the interaction region during drilling;

means for separating the collected light into a spectrum of wavelengths; and

means for analyzing at least a portion of the spectrum and producing a signal indicative of the exposed embedded material within the interaction region, wherein the drilling means is adapted to avoid damaging the irradiated embedded material upon receiving the signal from the analyzing means.

Satoru discloses a method of assessing the level of corrosion or susceptibility to corrosion of reinforcing members of a concrete structure through spectral analysis of light emitted by a plasma cloud of laser-ablated concrete. Satoru does not, however, disclose “means for analyzing at least a portion of the spectrum and producing a signal indicative of the exposed embedded material within the interaction region, wherein the drilling means is adapted to avoid damaging the irradiated embedded material upon receiving the signal from the analyzing means” as recited by amended Claim 15.

Accordingly, Applicants submit that Satoru does not disclose or suggest all of the limitations of amended Claim 15. For at least this reason, Applicants respectfully request the Examiner withdraw the rejection of Claim 15 and pass this claim to allowance.

Amended Claim 16 recites (emphasis added):

A method of detecting an embedded object within a laser-irradiated interaction region of a structure comprising the embedded object, the method comprising:

drilling a hole in the structure, thereby exposing the embedded object within the interaction region;

collecting light from the interaction region during drilling;

separating the collected light into a spectrum of wavelengths; and

analyzing at least a portion of the spectrum for indications of the exposed embedded object within the interaction region.

Appl. No. : **10/803,267**
Filed : **March 18, 2004**

Satoru discloses a method of detecting particulate composition of laser-ablated concrete. By contrast, amended Claim 16 recites, among other recitations, “a method of detecting an embedded object within a laser-irradiated interaction region of a structure ... the method comprising: drilling a hole in the structure, thereby exposing the embedded object within the interaction region ... and analyzing ... for indications of the exposed embedded object within the interaction region.”

Applicants submit that Satoru fails to disclose each and every limitation of amended Claim 16. For at least this reason, Applicants respectfully request the Examiner withdraw the rejection of Claim 16 and pass this claim to allowance.

Response to Provisional Rejection of Claims 15 and 16 for Obviousness-Type Double Patenting

In the August 9, 2006 Office Action, the Examiner rejects Claims 15 and 16 under the judicially-created doctrine of obviousness-type double patenting over Claims 11 and 12 of copending U.S. Patent Application No. 10/691,444.

In the interest of expediting allowance of the present application, Applicants are submitting herewith a terminal disclaimer to overcome the obviousness-type double patenting rejection of Claims 15 and 16. Applicants’ submission of this terminal disclaimer to obviate the nonstatutory double patenting rejection is not an admission of the propriety of the rejection (*see*, M.P.E.P. § 804.02 (II), August 2001, page 800-32). Applicants respectfully request that the Examiner withdraw the rejection of Claims 15 and 16 and pass these claims to allowance.

Claim 1 is not Obvious in View of Theriault and Davies

Claims 1-5 and 9-14 stand rejected under 35 U.S.C. § 103(a) as being obvious over Theriault *et al.* (U.S. Patent No. 6,147,754) (“Theriault”) in view of Davies (U.S. Patent No. 5,717,487) (“Davies”). Applicants respectfully traverse the present rejections. However, Applicants have amended Claim 1 to expedite prosecution of the application. Applicants expressly reserve the right to pursue the original version of Claims 1-14 through continuation practice.

Amended Claim 1 recites (emphasis added):

A detection system for use during irradiation of an interaction region of a structure with laser light, the structure comprising embedded material, the detection system comprising:

Appl. No. : 10/803,267
Filed : March 18, 2004

an optical system adapted to drill a hole having a depth in a portion of the structure by irradiating the interaction region with the laser light, thereby exposing a portion of the embedded material;

a collimating lens positioned to receive light emitted from the interaction region **during drilling**;

an optical fiber optically coupled to the collimating lens to receive light from the collimating lens; and

a spectrometer optically coupled to the optical fiber to receive light from the optical fiber, the spectrometer adapted for analysis of the light for indications of the embedded material within the interaction region, the spectrometer comprising:

an input slit adapted to receive light from the optical fiber, the input slit having a width selected to provide sufficient light transmittance and sufficient resolution;

an optical grating adapted to receive light from the input slit and to separate the light into a spectrum of wavelengths;

a collection lens adapted to receive a selected range of wavelengths of the separated light from the optical grating; and

a light sensor adapted to receive the selected range of wavelengths and to generate a signal corresponding to an intensity of the received light, **wherein the detection system is responsive to the signal by avoiding damage to the irradiated embedded material.**

Applicants submit that amended Claim 1 contains limitations not disclosed or suggested by the Theriault and Davies, either alone or in combination. For example, neither Theriault nor Davies discloses or suggests “an optical system adapted to drill a hole having a depth in a portion of the structure by irradiating the interaction region with the laser light, thereby exposing a portion of the embedded material” or “a light sensor adapted to receive the selected range of wavelengths and to generate a signal corresponding to an intensity of the received light, wherein the detection system is responsive to the signal by avoiding damage to the irradiated embedded material,” as recited by amended Claim 1.

Theriault discloses a laser-induced spectroscopy cone penetrometer which generates energy in a soil sample, collects generated energy, and transmits the energy. Theriault does not disclose or suggest “an optical system adapted to drill a hole having a depth in a portion of the structure by irradiating the interaction region with laser light, thereby exposing a portion of the embedded material” or “a light sensor adapted to receive the selected range of wavelengths and to generate a signal corresponding to an intensity of the received light, wherein the detection

Appl. No. : **10/803,267**
Filed : **March 18, 2004**

system is responsive to the signal by avoiding damage to the irradiated embedded material,” as recited by amended Claim 1.

Davies discloses a spectrometer which admits light through a lens and focuses the light on a diffraction grating, the light having its spectral constituents back through the lens for focusing on an image plane. Davies does not disclose or suggest “an optical system adapted to drill a hole having a depth in a portion of the structure by irradiating the interaction region with the laser light, thereby exposing a portion of the embedded material,” or “a light sensor adapted to receive the selected range of wavelengths and to generate a signal corresponding to an intensity of the received light, wherein the detection system is responsive to the signal by avoiding damage to the irradiated embedded material,” as recited by amended Claim 1.

Since the combination of Theriault and Davies does not disclose or suggest all the limitations of amended Claim 1, Applicants respectfully request the Examiner withdraw the rejection of Claim 1 and pass this claim to allowance.

Claims 2-9 and 12 depend from Claim 1, Claim 10 depends from Claim 9, Claims 11 depends from Claim 10, Claim 13 depends from Claim 12, and Claim 14 depends from Claim 13. Additionally, Applicants submit that Claims 2-14 also define over the cited reference, not only because they depend from amended Claim 1, but also on their own merit. Accordingly, Applicants respectfully request the Examiner withdraw the rejection and pass these claims to allowance.

Comments on New Claims 17-21

New Claims 17 and 18 depend from amended Claim 16. Thus, Claims 17 and 18 define over the cited references, alone or in combination, not only because they depend from amended Claim 16, but also on their own merit. Accordingly, Applicants respectfully request the Examiner to pass Claims 17 and 18 to allowance.

New Claims 19, 20, and 21 also define over the cited references, either alone or in combination.

None of new Claims 17-21 add new matter. Accordingly, Applicants respectfully request the Examiner pass these claims to allowance.

Appl. No. : 10/803,267
Filed : March 18, 2004

SUMMARY

For the reasons described above, Applicants respectfully request the Examiner withdraw the rejection of the claims and pass Claims 1-21 to allowance.

The undersigned has made a good faith effort to respond to all of the rejections and objections in the case and to place the claims in condition for immediate allowance. Nevertheless, if any undeveloped issues remain or if any issues require clarification, the Examiner is respectfully requested to call Applicant's attorney in order to resolve such issue promptly.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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